UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/826,153	04/16/2004	Erik C. Scher	01-002001	8584

33140 7590 12/27/2007

NANOSYS INC.
2625 HANOVER ST.
PALO ALTO, CA 94304

EXAMINER	
NEGIN, RUSSELL SCOTT	
ART UNIT	**PAPER NUMBER**
1631	

MAIL DATE	DELIVERY MODE
12/27/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/826,153	SCHER ET AL.	
	Examiner	Art Unit	
	Russell S. Negin	1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 October 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *26-37,40-42,44-48,60 and 61* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *26-37,40-42,44-48,60 and 61* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Comments

Applicants' amendments and request for reconsideration in the communication filed on 1 October 2007 are acknowledged and the amendments are entered.

Claims 26-37, 40-42, 44-48, and 60-61 are pending and examined in this Office action.

Withdrawn Rejections

The rejections of claims 26-42, 44-48, and 60-61 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention are withdrawn in view of amendments filed to the set of claims on 1 October 2007.

The rejections of claims 26-29, 31-38, 40, 46-48, and 60-61 under 35 U.S.C. 103(a) as being unpatentable over Cao et al. [Angew. Chem. Int. Ed., 1999, volume 38, pages 3692-3694] in view of Bruchez et al. [US Patent 6,274,323, issued August 14, 2001] are withdrawn in view of amendments to the claims filed on 1 October 2007..

The rejections of claims 41-42 under 35 U.S.C. 103(a) as being unpatentable over Cao et al. in view of Bruchez et al., and further in view of Weiss et al. [WO 00/55631] are withdrawn in view of arguments made by applicant on page 10 of the Remarks.

Claim Rejections - 35 USC § 112

The following rejections are newly applied:

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 41 and 42 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 41 recites a subset of the nanocrystals that comprises a predetermined intensity of emission at a wavelength. In this statement, it is unclear as to how a nanocrystal can comprise an intensity of emission. It is further unclear what is meant by "intensity of emission at a wavelength." In other words, it is unclear as to how an "intensity of emission" can occur at a wavelength. An amendment reciting "intensity of emission as a function of the wavelength of light," may overcome the instant rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

35 U.S.C. 103 Rejection #1:

Claims 26-29, 31-37, 40-42, 46-48, and 60-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cao et al. [Angew. Chem. Int. Ed., 1999, volume 38, pages 3692-3694] in view of Bruchez et al. [US Patent 6,274,323, issued August 14, 2001] as evidenced by Skoog et al. [Analytical Chemistry, 1992, page 606].

Claim 26 is drawn to a composition comprising a population of nanocrystals characterized by an excitation spectrum and an emission spectrum, wherein the emission spectrum and at least a portion of the excitation spectrum are in the nonvisible range; wherein the population of nanocrystals comprises two or more subsets of nanocrystals, the subsets characterized by different excitation wavelengths; wherein the emissions of the population comprise different wavelengths or different wavelength intensities when alternately excited with different excitation wavelengths; and wherein the population of nanocrystals are disposed in or linked to an adherent matrix.

The article of Cao et al. studies the synthesis and characterization of InAs/InP and InAs/CdSe core/shell nanocrystals.

In this article, InAs/InP has an absorbance spectrum in Figure 1.

In this article, InAs/InP has a fluorescence spectrum in Figure 5.

In this article, InAs/CdSe has an absorbance spectrum in Figure 2.

In this article, InAs/CdSe has a fluorescence spectrum in Figures 2 and 5.

Although the spectra are referred to as absorbance and fluorescence spectra in Cao et al., in this instance, these terms are synonymous with excitation and emission spectra, respectively. As is stated in Skoog et al. [Fundamentals of Analytical Chemistry, 1992, page 606]:

> Relationship between excitation spectra and fluorescence spectra:
> Because the energy difference between vibrational states is about the same for both ground and excited states, the absorption spectrum, or excitation spectrum, and the fluorescence spectrum for a compound often appear as mirror images of one another with overlap occurring at the resonance line. This effect is demonstrated by the spectra in Figure 23-2.

Consequently, Figure 23-2 of Skoog et al. illustrates differences between excitation and emission spectra and how they correspond to absorbance and excitation spectra respectively.

The units on the spectra are in eV. Visible light has wavelengths between 400 nm and 700 nm, which corresponds to energies between 3.10 eV and 1.77 eV, respectively. While the absorbance spectra (i.e. excitation spectra) are partially not in the range of visible light described of above, the fluorescence (i.e. emission spectra) are entirely not in the region of visible light as required by the instant claim in Figures 1, 2, and 5 of Cao et al. Since the absorbance and emission spectra of each species of

crystal are different, it is inherent that each species of crystal is alternately excited by different excitation wavelengths.

While Cao et al. discloses two nanocrystal species, Cao et al. does not disclose mixing the two crystal species into a single population or linking the nanocrystals into an adherent matrix.

The patent of Bruchez et al. uses semiconductor nanocrystals as detectable labels in various chemical and biological species. Bruchez et al. also discloses nanocrystal mixtures in column 8, lines 45-50. Bruchez et al. discloses using the nanocrystals adhered to several types of biopolymer in column 22, line 62 to column 23, line 5, which states:

> For example, the semiconductor nanocrystals of the present invention can readily be functionalized to create styrene or acrylate moieties, thus enabling the incorporation of the semiconductor nanocrystals into polystyrene, polyacrylate or other polymers such as polyimide, polyacrylamide, etc ...

Bruchez et al. continues in column 22, lines 23-35 by explaining how matrices and solid supports have the benefit of improved solubility and performance of the linked nanocrystals.

Claim 27 is further limiting with the additional limitation of the nanocrystal being a semiconductor nanocrystal.

Claim 28 is further limiting wherein the nanocrystal further comprise a diameter ranging from about 1000 nm to about 0.1 nm.

Claim 29 is further limiting wherein the nanocrystal further comprises a diameter ranging from about 50 nm to about 15 nm.

While Cao et al. does not teach these specific properties of nanocrystals, Bruchez et al. states in its abstract:

> The use of semiconductor nanocrystals as detectable labels in various chemical and biological applications is disclosed. The methods find use for detecting a single analyte, as well as multiple analytes by using more than one semiconductor nanocrystal as a detectable label, each of which emits at a distinct wavelength.

The term "semiconductor nanocrystal" is defined in column 8 of Bruchez et al., lines 59-65:

> The terms "semiconductor nanocrystal," "quantum dot," and "QdotTM nanocrystal" are used interchangeably herein and refer to an inorganic crystallite between about 1 nm and about 10000 nm in diameter or any integer or fraction of an integer therebetween, preferably between about 2 nm and about 50 nm...

Consequently, Bruchez et al. teaches the required properties of nanocrystal type and size.

Claim 31 is further limiting wherein the coated nanocrystals comprise an inner core, and the coating layer of the semiconductor comprises a band gap greater than that of the core.

Claim 32 is further limiting wherein the nanocrystals comprise InP.

Claim 33 is further limiting wherein the coating layer comprises CdSe.

Claim 34 is further limits the nanocrystal composition to comprise two or more sets of nanocrystals with differing emission wavelengths.

Claim 35 is further limiting wherein the additional limitation of restricting the spectral line widths.

Claim 37 is further limiting wherein the additional limitation of the excitation spectrum comprising ultraviolet, visible, or infrared wavelengths.

Claim 38 is further limiting wherein the additional limitation of comprising two or more sets of nanocrystals with differing excitation wavelengths.

The article of Cao et al. teaches the use of InAs/InP and InAs/CdSe core/shell nanocrystals. Cao et al. also teaches two populations of nanocrystals with differing excitation and emission wavelength characteristics, as set forth above.

Cao et al., however, does not teach bandgap differences between the cores and the shells of the nanocrystals.

On the subject of spectral widths and bandgaps energies, Bruchez et al. states in column 18, lines 1-5 and lines 19-23:

> However, for some applications high information density will not be required and it may be more economically attractive to use more polydisperse particles. Thus, for applications that do not require high information density, the linewidth of the emission may be in the range of 40-60 nm...
>
> Suitable materials for the overcoating layer include semiconductor materials having a higher bandgap energy than the semiconductor nanocrystal core.

The use of multiple populations of nanocrystals is described in column 19 lines 23-26 of Bruchez et al.

> The above method can be used to prepare separate populations of semiconductor nanocrystals, wherein each population exhibits a different characteristic photoluminescence spectrum.

Consequently, Bruchez et al. produces separate populations of semiconductor nanocrystals with each population having a specified and unique photoluminescence spectrum.

Claim 36 is further limiting wherein the nanocrystals are those manufactured by colloidal synthesis.

Columns 1 and 2 of pages 3694 of Cao et al. describe the colloidal synthesis process of the nanocrystals.

Claim 40 is further limiting wherein the emission spectrum comprises nonvisible wavelengths.

In Cao et al., the emission spectra have energies less that 1.77 eV, indicating that they are infrared (i.e. wavelength greater than 700 nm).

Claim 41 is further limiting wherein a subset of the nanocrystals comprises a predetermined intensity of emission at a wavelength.

Claim 42 is further limiting wherein the intensity is predetermined by varying the concentration of a nanocrystal constituent, the presence of an overcoating, or by varying representation of the nanocrystal subset.

Cao et al. teaches that the crystals emit at "determined" wavelengths and intensities; consequently, the predetermined intensity of emission is an inherent property. Further, the combination of Cao et al. and Bruchez et al. makes obvious a

combination of different subsets of nanocrystals. If each nanocrystal "type" or subset has a different emission wavelength, then the intensity inherent to the subset.

Claim 46 is further limiting wherein the adherent matrix comprises a polymer.

Claim 47 is further limiting wherein the composition is excitable or detectable through a barrier.

Claim 48 is further limiting wherein the barrier comprises animals.

Claim 60 is further limiting wherein the additional limitation that the population of nanocrystals linked to an adherent matrix, which adherent matrix comprises an affinity molecule of an antibody.

Claim 61 is drawn to an object tagged with the composition of claim 26.

Cao et al. does not describe polymers as adherent matrices or the use of animals as barriers.

Bruchez et al., however, states that polymers or animals can be used as detectable barriers for the semiconductor nanocrystals.

The patent of Bruchez et al. uses semiconductor nanocrystals as detectable labels in various chemical and biological species. Bruchez et al. discloses using the nanocrystals as adherents to several types of biopolymer in column 22, line 62 to column 23, line 5, which states:

> For example, the semiconductor nanocrystals of the present invention can readily be functionalized to create styrene or acrylate moieties, thus enabling the incorporation of the semiconductor nanocrystals into polystyrene, polyacrylate or other polymers such as polyimide, polyacrylamide, etc ...

Consequently, the polymers or biopolymers are the affinity molecules and objects tagged with the nanocrystals.

Bruchez et al. continues on column 23, lines 50-60 by explaining that the semiconductor nanocrystals can be used in animals in which animals themselves are the barriers.

It would have been obvious to someone of ordinary skill in the art at the time of the instant invention to modify the nanocrystals of Cao et al. by use of the adherent polymers of Bruchez et al. wherein the motivation would have been that Bruchez et al. teaches use of the required substrates with the advantages of the increased the solubility and functionality of the nanocrystals [see Bruchez et al., column 22, line 62 to column 23, line 5]. It would have been additionally obvious to modify the two crystals of Cao et al. by producing a mixture of the two crystal types (i.e. such as indicated in Bruchez et al., column 8, lines 45-50) because such a mixture is needed to produce the effective semiconductor nanocrystals of Bruchez et al. It would have been additionally obvious to make the nanocrystals as semiconductors because semiconductor nanocrystals can be used as reliable and sensitive detectable labels in a variety of biological and chemical formats [see column 4, lines 43-50 of Bruchez et al.] For example, putting the semiconductor nanocrystals into animals causes the nanocrystals to be effective markers of biological compounds in vivo [see, for example, column 3, lines 55-58]. There is also obviousness in making the nanocrystals with the desired bandgap because, unlike organic dyes with fluorescence in the visible range, the

claimed types of semiconductor nanocrystals minimize spectral overlap [see column 4, lines 25-30 of Bruchez et al.]

Response to Arguments:

Applicant's arguments filed 1 October 2007 have been fully considered but they are not persuasive.

Applicant first argues on page 8 of the Remarks that the Cao et al. reference does not disclose at least a composition of two crystal species, and does not disclose linking nanocrystals to an adherent matrix. These arguments are not persuasive because Cao et al. discloses the two crystal species of InAs/InP and InAs/CdSe. Furthermore, Bruchez et al. uses mixtures of nanocrystals as required by the instant set of claims to produce semiconductor nanocrystals. Furthermore, one of the reasons the study of Bruchez et al. is used is to disclose linking of nanocrystals to an adherent matrix.

Applicant next disputes the asserted equivalence of absorption spectrum and excitation spectrum as stated on page 606 of Skoog et al. Applicant alleges that absorption spectrum and the excitation spectrum are well known in the prior art to be different quantities but does not point any definition in the specification nor provides any evidence from the prior art to substantiate this argument and/or rebut the evidence of Skoog et al. Since the nanocrystals fluoresce, the absorbance and excitation spectra coincide and it is maintained that Skoog et al. states that absorbance and excitation spectra are equivalent in such an instance.

Applicant next argues on pages 8-9 that the references of Cao et al. and Bruchez et al. do not teach excitation at multiple wavelengths. However, the fact that the two nanocrystals of Cao et al. have distinct excitation and emissions spectra indicates that they are inherently capable of being alternately excited by different wavelengths.

Claims 36 and 61 are addressed in the above rejection.

Applicant additionally argues that claims 47 and 48 are not taught in the prior art because the composition is not detectable "through" a barrier. This argument is not persuasive because, in this instance, the barrier through which the nanocrystal is detected is the actual animal tissue.

35 U.S.C. 103 Rejection #2:

Claims 44-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cao et al. in view of Bruchez et al. as applied to claims 26-29, 31-37, 40-42, 46-48, and 60-61 above, and further in view of Weiss et al. [WO 00/55631].

Claim 44 is further limiting in that the population of nanocrystals comprises a predetermined excitation spectra or emission spectra.

Claim 45 is further limiting by varying the size of the nanocrystal.

Cao et al. and Bruchez et al. make obvious the composition of nanocrystals.

Cao et al. and Bruchez et al. fail to teach a predetermined excitation or emission spectra by varying size of the nanocrystals.

The patent of Weiss et al. investigates nanocrystal probes for biological applications and states on page 14, lines 14-20:

> Furthermore, the frequency and wavelength of the narrow wavelength band of light emitted form the semiconductor nanocrystal may be further selected according to the physical properties, such as size, of the semiconductor nanocrystal. The wavelength band of light emitted by the semiconductor nanocrystal, formed using the above embodiment, may be determined by either (1) the size of the core, or (2) the size of the core and the size of the shell...

Consequently, the limitations of varying the size of the nanocrystal to produce a determined excitation or emissions spectrum are addressed.

On page 15, lines 5-12, Weiss et al. states, "Selection of the emission wavelength by varying the composition, or alloy, of the semiconductor nanocrystal is old in the art. As an illustration, when CdS semiconductor nanocrystal, having an emission wavelength of 400 nm, may be alloyed with a CdSe semiconductor nanocrystal, having an emission wavelength of 530 nm."

On page 53, lines 12-28, Weiss et al. explains the advantages of using their semiconductor nanocrystals:

> Thus, the invention provides an semiconductor nanocrystal probe containing a semiconductor nanocrystal capable, upon excitation by either electromagnetic radiation (of either narrow or broad bandwidth) or particle beam, of emitting electromagnetic radiation in a narrow wavelength band and/or absorbing energy and/or scattering or diffracting said excitation, thus permitting the simultaneous usage of a number of such probes emitting different wavelengths of electromagnetic radiation to thereby permit simultaneous detection of the presence of a number of detectable substances in a given material. The probe material is stable in the presence of light or oxygen, capable of being excited by energy over a wide spectrum, and has a narrow band of emission, resulting in an improved material and process for the simultaneous and/or sequential detection of a number of detectable substances in a material such as a biological material.

Consequently, the advantage of the technique of Weiss et al. is simultaneous detection of a number of detectable substances in a biological material.

It would have been obvious at the time of the instant invention for someone of ordinary skill in the art to practice the inventions of Cao et al. in view of Bruchez et al. as applied above, and further in view of Weiss et al. [WO 00/55631] wherein the motivation would have been that Weiss et al. has the advantage of detecting multiple substances simultaneously using a given wavelength of excitation relevant to biological applications [see page 53, lines 12-8 of Weiss et al.].

Response to Arguments:

Applicant's arguments filed 1 October 2007 have been fully considered but they are not persuasive. Applicant's arguments only concern claims 41-42, which are not rejected herein. Applicant has no arguments specific to claims 41 and 42.

35 U.S.C. 103 Rejection #3:

Claims 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cao et al. in view of Bruchez et al. as applied to claims 26-29, 31-37, 40-42, 44-48, and 60-61 above, and further in view of Bruchez et al. [Science, volume 281, 1998, pages 2013-2016, Information Disclosure Statement, source CA, 19 October 2004]. This second Bruchez reference will be referred to as "Bruchez et al. (1998)."

Claim 30 depends from claim 27 with the additional limitation that the production of the nanocrystals employs the usage of substitutes silanes.

Cao et al. and Bruchez et al. make obvious the composition of nanocrystals.

Cao et al. in view of Bruchez et al. fail to teach use of substituted silanes.

The article of Bruchez et al. (1998) investigates semiconductor nanocrystals as fluorescent biological labels and states in the abstract:

> Semiconductor nanocrystals were prepared for use as fluorescent probes in biological staining and diagnostics. Compared with conventional fluorophores, the nanocrystals have a narrow, tunable, symmetric emission spectrum and are photochemically stable. The advantages of the broad, continuous excitation spectrum were demonstrated in the dual emission, single excitation labeling experiment on mouse fibroblasts. These nanocrystal probes are thus complementary and in some cases may be superior to existing fluorophrores.

Consequently, Bruchez et al. (1998) investigates semiconductor nanocrystals with dual emission in mouse fibroblasts.

Bruchez et al. (1998) ends the article by stating:

> The development of nanocrystals for biological labeling opens up new possibilities for many multicolor experiments and diagnostics. Further, it established a class of fluorescent probe for which no small organic molecule equivalent exists. The tunability of the optical features allows for their use as direct probes or as sensitizers for traditional probes. These nanocrystals have long fluorescent lifetimes (hundreds of nanoseconds), which can allow for time-gated detection for autofluorescence suppression. Further development, such as direct immunolabeling, in situ hybridization, and incorporation into microspheres will be important for applications such as cytometry and immunocytobiology. In addition nanocrystal probes may prove useful for other contrast mechanisms such as x-ray fluorescence, x-ray absorption, electron microscopy, and scintillation proximity imaging, and the use if for-red or infrared-emitting nanocrystals (InP and InAs) as tunable, robust infrared dyes is another possibility.

Consequently, there are advantages of using nanocrystals in biological applications.

Footnote number 20 on page 2015 of Bruchez et al. (1998) shows how the nanocrystals are synthesized using substituted silanes and the formation of polymers (footnotes 20 and 22). Use of silanes is a widely accepted procedure for generating nanocrystals.

It would have been obvious to someone of ordinary skill in the art at the time of the instant invention to modify the inventions of Cao et al. in view of Bruchez et al., and further in view of Bruchez et al. (1998) because Bruchez et al. (1998) has the

advantage of improving a common technique in the art (use of silanes to make nanocrystals) to generate the nanocrystals with tunable wavelengths; this improvement results in better performance of biological measurement techniques (i.e. X-ray fluorescence, x-ray absorption, and scintillation proximity imaging).

Response to Arguments:

Applicant's arguments filed 1 October 2007 have been fully considered but they are not persuasive. Applicant has no argument specific to claim 30 in the Remarks.

Conclusion

No claim is allowed.

Papers related to this application may be submitted to Technical Center 1600 by facsimile transmission. Papers should be faxed to Technical Center 1600 via the central PTO Fax Center. The faxing of such pages must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993)(See 37 CFR § 1.6(d)). The Central PTO Fax Center Number is (571) 273-8300.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Russell Negin, Ph.D., whose telephone number is (571) 272-1083. The examiner can normally be reached on Monday-Friday from 7am to 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's Supervisor, Marjorie Moran, Supervisory Patent Examiner, can be reached at (571) 272-0720.

Information regarding the status of the application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information on the PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RSN
20 December 2007

/Marjorie A. Moran/
SPE, AU 1631
12/21/07